



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/22/96 275 10/12/96 FRIEND

3001-029-999

020583 HM12/0214
TENNIE AND EDMONDS
1155 AVENUE OF THE AMERICAS
NEW YORK NY 10036-2711

EXAMINER

LUNDGREN, J.
ART UNIT PAPER NUMBER

1631
DATE MAILED:

02/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/220,275

Applicant(s)

FRIEND ET AL

Examiner

Jeffrey Lundgren

Art Unit

1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-64 and 67-76 is/are pending in the application.
- 4a) Of the above claim(s) 1-57 and 67-69 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 58-64 and 70-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 and 9
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II (claims 58-64, and newly added claims 70-76) in Paper No. 11 received on October 20, 2000, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 1-57, and 67-69 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 11.

Objections

3. Claims 58-64, and 70-76 are objected to because of the following informalities: where a claim sets forth a plurality of steps or elements, each step or element should be separated by a line indentation (see M.P.E.P. § 2173.05 (n)(i)).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 58-64, and 70-76, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 58 and 71, are indefinite for failing to recite a final process step which agrees back with the preamble. While minor details are not required in method/process claims, at least the basic steps must be recited in a positive, active fashion. See *Ex*

parte Elrich, 3 USPQ2d, p. 1011 (Bd. Pat App. Int. 1986). For example, claim 58 is drawn to a method of removing one or more artifacts from a measured biological profile, yet the claim recites a final step of subtracting one or more artifact patterns from the measured biological profile. The claims do not set forth the conditions/state when the method has removed the artifact, only the removal of the artifact pattern, which may or may not comprise the entire artifact.

Claims 58-64, and 70-76, are indefinite for the use of the term "artifact" as a means to define an "unwanted response components" manifested within the measured data sets (page 34 of the instant specification). Further, Applicants' definition by way of example through Di Risi on page 34 does not establish the term as definite. Applicants' artifacts, wherein artifacts are defined by as components that are not part of the *actual* biological state or response, are also indefinite within the context of the claim (page 34:28). Applicants description of the "artifact" on page 35:4-9 of the instant specification is also indefinite. For example, an artifact is only an artifact *in comparison* to a reference measurement with a predetermined descriptor, as removing the artifact would require some prerequisite knowledge about the artifact. The skilled artisan would not reasonably be able to determine the metes and bounds of the artifact as claimed.

Moreover, the terms "artifact pattern", "artifact signature", and "artifact template", are also indefinite for the above reasons, and are not distinguishable, one from the other (see pages 34-36, and page 74 of the instant specification).

Claim 59 is indefinite for reciting the phrase "knowledge of the variables" as a source of determination. The skilled artisan would not reasonably be able to determine the metes and bounds of this limitation, because it is not clear as to the elements that comprise knowledge, or knowledge of variables.

Claims 59-61 recites the limitation "the respective artifact". There is insufficient antecedent basis for this limitation in the claims. An amendment to the claims deleting the term "respective", would overcome the rejection.

Claim 59 is indefinite for reciting the term "relative" as a means of describing a type of amplitude. The skilled artisan would not be able to determine amplitudes which Applicants *consider relative*, and those which are *not considered relative*.

Claim 59 recites the limitation "[the]...relative amplitudes". There is insufficient antecedent basis for this limitation in the claim.

Claim 60 is indefinite for reciting the phrase "suspected causative *variable*" as a means to define a component which may have or may not have had an effect on the measured/perturbed biological profile, because the skilled artisan would not be able to determine the metes and bounds of this limitation.

Claims 63-64, and 70-76, are indefinite for reciting the phrase "objective function" as a mathematical component in the method of removing one or more artifacts. The skilled artisan would not be able to determine the metes and bounds of this limitation.

Claim 70 is indefinite for reciting the phrase "each cellular constituent's *contribution*", as the skilled artisan would not be able to reasonably determine the metes and bounds of this limitation. Applicants have not clearly established what the "contribution" comprises, or what elements the cellular constituents are contributing to the objective function.

Claim 70 recites the limitation "the relative certainty or significance". There is insufficient antecedent basis for this limitation in the claim, as it is not clear that the measured value of said cellular constituents have relative certainty or significance by default.

Claims 70 and 75-76, are indefinite for reciting the term "relative" as a means of describing a type certainty and significance. The skilled artisan would not be able to distinguish between certainties and significances which Applicants *consider relative*, and those which are *not considered relative*.

Claims 71-72 are indefinite for reciting the phrase "levels of severity", as means to further limit the claimed artifacts, because the skilled artisan would not be able to determine the metes and bounds of this limitation.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1631

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claim 58 is rejected under 35 U.S.C. 102(e) as being anticipate by Garini *et al.* (U.S. Patent No. 5,798,262, August 25, 1998).

Claim 58 is drawn to a method for removing one or more artifacts from a measured biological profile, wherein the biological profile comprises measurements of a plurality of cellular constituents, said method comprising subtracting one or more artifact patterns from the measured biological profile.

Garini discloses a method involved in the classification of chromosomal banding from various cell samples. The method involves removing one or more artifact patterns from the biological profile (i.e., the measured fluorescence image of the mapped chromosomes) by background subtraction and internal reference normalization, which read on the artifacts/artifact patterns (see *Summary of the Invention*; and column 23:12-39).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 58-64, and 70-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garini *et al.* (U.S. Patent No. 5,798,262, August 25, 1998).

Claim 58-64, and 70-76, are drawn to a method for removing one or more artifacts from a measured biological profile, wherein the biological profile comprises measurements of a plurality of cellular constituents, said method comprising subtracting one or more artifact patterns from the measured biological profile. Applicants further claim a method wherein the artifact patterns comprise independent scaling coefficients, and using "objective functions" which are determined by least squares minimization for classifying the biological profile. Further, artifacts are removed by comparison to a library of artifacts signatures/templates "generate" an artifact template.

In addition to the invention as disclosed by Garini for chromosomal classification, Garini summarizes prior art methods using combinatorial methods for spectral karyotyping and chromosomal classification (see *Field and Background of the Invention*; especially column 4:12 to column 7:20). The method of generating the karyotype comprises a multi-spectral measurement of the optical signals from multiple chromosomal markers (i.e., a measured biological profile comprising a plurality of cellular constituents). The resulting karyotype can be presented in color-coded format by RGB display and classification format, wherein classification is carried out through an algorithm that removes/subtracts artifacts through an artifact pattern/template, such as a minimal square error (MSE) algorithm as in Equation 1 (i.e., a least squares minimization). The algorithm utilizes a reference spectrum, wherein the reference spectrum comprises a plurality of pixel measurements, wherein the pixel measurements are stored in a reference library. The pixels can be independently weighted for

removing the artifact of each pixel through normalization. Through the MSE algorithm, the data (i.e., measured biological profile) are compared to a library of artifact signatures, specifically, the reference spectra of the pixel array, and produces an artificial color-coded representation for classification determination (see column 5:19-61), wherein each pixel is determined by $S_{x,y,n}$ (i.e., relative certainty or significance). The method comprises generating a library of karyotype signatures for comparison to a measured biological profile (i.e., sample chromosomes) for classification, wherein the library of karyotyping signatures comprises artifact signatures, which when comparing the measure biological profile to the reference library, produces an artifact template to be subtracted from the sample karyotype, thereby producing a karyotype free of artifacts (column 6:43-54). The origin of artifacts is explained, such as artifacts arising from differences between instrumental responses, and are best removed by the internal reference spectra (see column 6:55 to column 7:24).

The disclosure of Garini is *functionally equivalent* to the invention as claimed by Applicant. Although there are semantic differences with respect to the claimed "comparing said measured biological profile to a library of artifact signatures to generate an artifact template" which is then subtracted, the method as taught by Garini is functionally the same. As Garini summarizes the method (column 6:43-54), the comparison of the sample spectra to the reference library through the MSE algorithm *effectively produces the library of artifact signatures* and performs pattern matching. There are no limitations of Applicants' claimed invention, as supported in the specification (pages 34-36, and page 74), that would distinguish it from that of the prior art.

Conclusion

11. No claims are allowable.
12. Any inquiry concerning the *merits* of this communication or earlier communications from the Examiner should be directed to Jeffrey S. Lundgren, whose

Art Unit: 1631

telephone number is (703) 306-3221. The Examiner can normally be reached on Monday-Friday from 7:00 AM to 5:00 PM (EST).

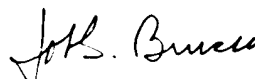
If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Michael Woodward, can be reached at (703) 308-4028.

Any inquiries of a *general* nature relating to this application should be directed to Ms. Pauline Farrier, Patent Analyst for Art Unit 1631, whose telephone number is (703) 305-3550.

Papers related to this application may be submitted by facsimile transmission. Papers should be faxed to Group 1631 using (703) 308-0294. Please notify the Examiner of incoming facsimiles prior to sending papers to the aforementioned fax number. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG (November 15, 1989).



Jeffrey S. Lundgren, Ph.D.



JOHN S. BRUSCA, Ph.D.
PRIMARY EXAMINER